

OÜ Inseneribüroo STEIGER

**Timmo liivamaardla
Timmo liivakarjääri
markšneiderimõõdistamise seletuskiri**
(varu seisuga 13.10.2017)

Töö nr 17/2003

Tallinn 2017

Kinnitan

Allan Koger
Juhatuses liige

.....

Kaevandatud maavaravaru arvutas:

Peeter Koll
Markšeider

.....

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1. SISSEJUHATUS

Timmo liivamaardla (registrikaart nr. 885) Timmo liivakarjääris (pindala 4,54 ha) kaevandab ehitus – ja täiteliiva Maanteeamet Keskkonnaameti 12.01.2016. a antud maavara kaevandamise loa VILM-049 alusel. Kaevandamisluba kehtib kuni 21.03.2026. a. Mäeeraldisega on seotud Timmo liivamaardla ehitusliiva aktiivse tarbevaru plokid nr 2 ja nr 3 ning täiteliiva aktiivse tarbevaru plokid nr 1 ja nr 4. Kaevandamise loas on märgitud mäeeraldisega aktiivseks ehitusliiva varuks 72 tuh m³ ja täiteliiva aktiivseks varuks 224 tuh m³, millest kaevandatav ehitusliiva varu on 58 tuh m³ ja täiteliiva varu 161 tuh m³.

Markšeiderimõõdistuse ja kaevandatud maavaravaru ning sellest lähtuvalt jääkvaru arvutuse Timmo liivakarjääri mäeeraldises piires tegi Maanteeameti tellimusel OÜ Inseneribüroo STEIGER. Kaevandatud mahu arvutuse aluseks on 13.10.2017. a markšeiderimõõdistus. Välitööd tegid markšeiderid Allan Koger ja Peeter Koll ning geodeet Ranno Talvik. Välitööde käigus kontrolliti mäeeraldises, mäeeraldises teenindusmaa ja katastriüksuse piiripunktide olemasolu ja paiknemist, puuduvad piiripunktid taastati metall – või plastpostidega. Kameraaltööd tegi markšeider Peeter Koll. Mäetööde plaani koostamisel on kasutatud lisaks käesoleva mõõdistuse andmetele ka OÜ Eesti Geoloogiakeskus 2015. a. Timmo liivakarjääri maavara kaevandamisloa taotlust ning 2013. a. Timmo liivakarjääri markšeiderimõõdistamise andmeid.

Markšeiderimõõdistamine Timmo liivakarjääris tehti reaalaajas kinemaatilise (RTK) GNSS positsioneerimisega, seadmega Trimble R8-2 GNSS. Mõõdistati L-EST97 tasapinnaliste ristkoordinaatide süsteemis, kõrgused Balti 77 süsteemis. Lähtekoordinaadid ja kõrgused - Trimble VRS Now püsijaamade võrk.

Käesolevas seletuskirjas esitatakse Timmo liivakarjääris 31.12.2014 – 13.10.2017. a kaevandatud maavaravaru ning selle alusel tehtud jääkvaru arvutuse materjalid. Lisatud on mäetööde plaan (joonis 1/2), mäeeraldises plaani geoloogilised läbilõiked (joonis 2/2).

Markšeiderimõõdistamine ja varu arvutus on tehtud vastavuses keskkonnaministri 05.04.2011. a määrusele nr 22 “Keskkonnatasu deklaratsiooni vormid ja nende täitmise ning maavaravaru kaevandamise mahu aruande esitamise kord” ja majandus- ja kommunikatsiooniministri 23.01.2012. a määrusele nr 9 „Markšeideritöö kord“.

2. MÄEERALDISE ÜLDISELOOMUSTUS JA UURITUS

2.1 Karjääri asukoht

Timmo liivakarjääri mäeeraldis asub Viljandimaal Karksi vallas, Karksi-Nuia alevist ca 10 km lõunas, Lilli külas. See paikneb Timmo kruusakarjääri maaüksusel (KÜ 60002:004:0650), mille volitatud asutuseks on Maanteeamet. Mäeeraldisega seotud kinnistu külgneb läänest, põhja poolt ja loodest Kiisa (kat.-üksus 60002:004:0570) ning ida ja lõuna poolt Ilu (kat.-üksus 60002:004:0210) maaüksuste metsamaaga. Mäeeraldisest edelas kulgeb avalikus kasutuses Lannu–Nahkru–Sõrmuse tee 600001.

Alates 1964. aastast kaevandatud alaga kattuv mäeeraldis teenindusmaa edelaosa on liigniiske ja võsastunud abs kõrgustega 106–107 m, mille nõlvad on osaliselt tasandatud. Mäeeraldisel territooriumi ümbritsevad 2–5 m kõrgused kattepinna vallid. Mäeeraldisel teenindusmaa pindala on 6,11 ha, sh mäeeraldisel pindala 4,54 ha.

2.2 Geoloogiline uuritus

Piirkonna esmased uuringud tegi 1964. aastal RPI “Eesti Põllumajandusprojekt” ja Viljandi Teedevalitsus. Uuringuga läbiti käesolevaks ajaks väljakaevandatud ca 2 m paksune keskmise kuni jämeda kruusa kiht. 6 proovi põhjal määrati kruusa kuluvuseks 27,5%, mahukaaluks 1250–1760, kruusa saviosakeste sisalduseks mäeeraldisel keskosas 4,8%, ja idaosas 59%. Topomõõdistamisel kasutati suhtelisi kõrgusi ja koordinaate.

1994. a. arvutas Viljandi Teedevalitsus lõigete meetodil mäeeraldisel jääkvaru 165 tuh m³ suuruses mahus. Eesti Maavarade Komisjoni 14.04.1994. aasta õiend nr 999 kvalifitseeris Timmo karjääri materjali kõrgest savi-tolmu sisaldusest tingitult maa-aineseks (laboriuuringud puuduvad). Viljandi Maavalitsuse Keskkonnaosakond väljastas 04.08.1994. a. Viljandi Teedevalitsusele maavara kasutusloa VIMA-103, mis Karksi Vallavalitsuse 20.06.2001. a. korraldusega nr 321 vormistati ümber maavara kaevandamise loaks. 1998. aastal tegi Viljandi Teedevalitsus mäeeraldisel, mille alumine piir paikneb veetasemest kõrgemal, täiendava geoloogilise uuringu. 2003. aastal väljastas Karksi Vallavalitsus Pärnu Teedevalitsusele Timmo maa-ainese karjääri mäeeraldisel (6,10 ha) kaevandamisloa nr 75006397.

2010. aastal määras OÜ Eesti Geoloogiakeskus Timmo maa-ainese karjääri mäeeraldisel seni maavarana aktsepteerimata liiva varu mahu, kvaliteedinäitajad ning kasutusvaldkonnad. Uuringu käigus rajati 15 puurauku ja 10 kaevandit, laboriuuringuteks võeti 66 proovi, koostati ala topoplaan mõõtkavas 1:1000. Uuring selgitas maavara leviku seisukohalt perspektiivitu piirkonna maa-ainese mäeeraldisel ja selle lamami edelaosas. Uuringu tulemusena arvutati varu maht kahe varuplokina põhjaveetasemest kõrgemal ja kahe varuplokina madalamal, nende vahelise piiri määrasid uuringu-aegsed veetaseme abs kõrgused. Keskkonnaministri 25.06.2010. a. käskkiri nr 883 kinnitas seisuga 01. 04. 2010. a Timmo liivamaardla varuna senise mäeeraldisel territooriumi 4,54 ha suurusel alal ja selle lamamis leviva maavara aktiivse tarbevaru. Kinnitatud varu baasil väljastas Keskkonnaameti Pärnu–Viljandi regioon Maanteeametile Timmo liivakarjääri mäeeraldisel kaevandamise loa VILM-049.

Maanteeamet teostas 2014. aastal mäeeraldisega seotud Timmo kruusakarjääri katastriüksuse (tunnus 60002:004:0650) suvaliste koordinaatide süsteemist L-EST koordinaatide süsteemi ümbermõõdistamise, mille tulemusena tekkisid ebakõlad mäeeraldisel piiri ja katastriüksuse kattumises. Piiride korrigeerimiseks esitas Maanteeamet 2015. a. maavara kaevandamise loa muutmise taotluse, mille alusel väljastas Keskkonnaamet 12.01.2016 muudetud maavara kaevandamise loa.

3. KAEVANDATUD MAAVARAVARU JA JÄÄKVARU ARVUTUS

13.10.2017. a. markšeiderimõõdistuse andmete põhjal koostatud plaani ja maavara kaevandamise loa plaani (31.12.2014. a.) võrdlemisel selgus, et ajavahemikul 31.12.2014 – 13.10.2017 Timmo liivakarjääri mäeeraldisel maavara kaevandatud ei ole.

Varasemast kaevandamise perioodist on mäeeraldisel põhjaosas ladustatud kahes puistangus katendit kokku 2 355 m³ ning kruusa 1 956 m³.

Kuna kaevandamist toimunud ei ole, siis on mäeeraldisel jääkvaru vastavalt maavara kaevandamise loale:

- Aktiivse tarbevaru plokk 1 (veepealne täiteliiv) – 63,3 tuh m³
- Aktiivse tarbevaru plokk 2 (veepealne ehitusliiv) – 16,4 tuh m³
- Aktiivse tarbevaru plokk 3 (veealune ehitusliiv) – 55,8 tuh m³
- Aktiivse tarbevaru plokk 4 (veealune täiteliiv) – 161 tuh m³

Timmo liivakarjääri mäeeraldisel kõrvalt ega lamamist ei ole looduslikust olekust välja viidud maavara varu ega keskkonnaregistris arvele võtmata kivimit või setendit.

Kaevandamisega rikutud maa pindala Timmo liivakarjääri mäeeraldisel teenindusmaal on 5,97 ha.

4. KASUTATUD KIRJANDUS

1. Keskkonnaministri 05. aprilli 2011. a määrus nr 22 “Keskkonnatasu deklaratsiooni vormid ja nende täitmise ning maavaravaru kaevandamise mahu aruande esitamise kord”;
2. Majandus- ja kommunikatsiooniministri 23. jaanuar 2012. a määrus nr 9 „Markšeideritöö kord“
3. Timmo liivakarjääri mäeeraldise maavara kaevandamise loa VILM-049 muutmise taotlus, OÜ Eesti Geoloogiakeskus 2015. a.
4. Viljandimaa Timmo liivakarjääri mäeeraldise (VILM-049) markšeiderimõõdistamise seletuskiri (seisuga 14.11.2013. a.), OÜ Eesti Geoloogiakeskus (Sven Kärber, Mati Rammo), 2013. a.

LISA 1

TOPOGRAAFILISE MÕÕDISTAMISE SELETUSKIRI

Töö nr:	17/2003
Objekt:	Timmo liivamaardla Timmo liivakarjäär
Objekti asukoht:	Viljandi maakond, Mulgi vald, Lilli küla
Katastriüksuse nimi ja tunnus:	Timmo kruusakarjäär (60002:004:0650)
Katastriüksuse pindala:	6,11 ha
Naaberkatastriüksused:	Kiisa (60002:004:0570) Ilu (60002:004:0210)
Mäeeraldise pindala:	4,54 ha
Mäeeraldise teenindusmaa pindala:	6,11 ha
Mõõdistatud ala pindala:	5,51 ha
Töö tellija:	Maanteeamet
Töö läbiviijad:	Allan Koger, Ranno Talvik, Peeter Koll
Kameraaltööd:	Peeter Koll
Töö teostamise aeg:	
– Välitööd	13.10.2017
– Kameraaltöö	oktoober 2017
Mõõdistamise eesmärk:	Situatsiooni mõõdistamine ja mäetööde seisu fikseerimine
Koordinaatide süsteem:	L-Est 97, kõrgused Balti 77 süsteemis
Mõõdistamisalus:	Trimble VRS Now püsijaamade võrk
Mõõdistamisviis:	GNSS mõõdistus
Kasutatud instrumendid:	Trimble R8-2 GNSS süsteem horisontaalne mõõtetäpsus ± 10 mm +1 mm/km, vertikaalne mõõtetäpsus ± 20 mm +1 mm/km
Plaani mõõtkava:	M 1:1000
Arvuti tarkvara:	Mapinfo 9.0(litsents:MINWES0900922272) Vertical Mapper 3.1 Bentley PowerCivil V8i (litsents: 70000661800020)

Peeter Koll
Markšeider
06.11.2017

LISA 2

GPS MÕÕDISTUSE ANDMED (13.10.2017)

Nr	x	y	kõrgus	kood
1,6431915.604,593977.913,106.332,p	68,6431879.846,593909.122,108.708,p	129,6431838.608,593948.291,111.005,va		
2,6431914.767,593994.810,106.799,na st	69,6431880.256,593895.156,108.369,nu st	130,6431838.747,593946.903,110.828,nu st		
3,6431893.674,593985.720,107.072,na	70,6431862.294,593879.353,107.894,nu			
4,6431880.750,593977.424,106.909,na	71,6431840.556,593860.616,107.382,p	131,6431834.387,593943.456,110.745,nu		
5,6431870.302,593972.296,107.342,na	72,6431830.585,593845.847,106.761,lm	132,6431835.905,593940.646,110.353,nu		
6,6431866.395,593967.666,107.072,na	73,6431832.804,593834.420,107.153,lm	133,6431836.263,593937.268,110.310,nu		
7,6431866.347,593967.658,107.065,nu st	74,6431803.445,593825.938,107.506,tt	134,6431839.067,593937.737,110.266,nu		
8,6431868.176,593966.485,107.100,nu	75,6431793.209,593818.180,107.502,tt	135,6431840.839,593939.772,110.289,nu		
9,6431870.512,593962.041,107.046,nu	76,6431786.286,593804.289,107.085,tt	136,6431838.245,593944.189,109.894,na st		
10,6431872.160,593961.697,107.031,nu	77,6431785.834,593793.970,107.125,tt			
11,6431875.929,593954.877,107.050,nu	78,6431794.282,593791.075,107.997,bpost	137,6431836.391,593942.790,109.660,na		
12,6431876.171,593952.860,107.008,nu	79,6431794.382,593791.117,107.727,bpost	138,6431837.200,593941.444,109.479,na		
13,6431874.886,593942.685,106.731,nu	80,6431794.330,593791.148,107.948,bpost	139,6431837.787,593940.583,109.339,p		
14,6431873.662,593940.831,106.686,nu	y	140,6431837.145,593939.452,109.477,na		
15,6431873.093,593942.490,105.866,na st	81,6431794.341,593791.137,108.015,bpost	141,6431837.761,593938.901,109.452,na		
16,6431872.190,593944.862,105.693,na	y	142,6431838.662,593940.619,109.428,na		
17,6431871.175,593945.962,105.566,na	82,6431802.924,593847.827,107.288,tt	143,6431838.603,593941.194,109.545,na		
18,6431872.759,593950.305,105.351,na	83,6431780.706,593854.639,106.985,tt	144,6431838.564,593941.184,109.534,vp st		
19,6431873.142,593954.349,105.329,na	84,6431766.094,593863.544,106.908,toru			
20,6431871.554,593959.732,106.012,na	85,6431766.101,593863.529,106.924,toru	145,6431837.288,593941.619,109.527,vp		
21,6431869.621,593960.315,105.818,na	86,6431767.781,593863.769,106.648,va st	146,6431837.437,593941.606,109.544,vt		
22,6431866.227,593966.085,106.330,na	87,6431769.938,593860.172,106.788,va	147,6431841.603,593938.774,110.447,va		
23,6431864.064,593964.983,106.127,na	88,6431769.986,593862.752,107.265,vu st	148,6431844.060,593935.244,110.441,va		
24,6431852.855,593963.060,106.843,na	89,6431796.770,593874.156,107.705,va	149,6431849.568,593931.894,110.007,va		
25,6431852.223,593961.857,106.768,na	90,6431798.847,593880.594,109.290,vu	150,6431849.484,593934.043,110.763,vu st		
26,6431853.137,593960.022,106.455,na	91,6431810.451,593888.220,113.342,vu			
27,6431854.090,593955.769,106.318,na	92,6431810.049,593889.305,113.462,vu	151,6431845.650,593940.087,111.828,vu		
28,6431852.912,593953.251,106.608,na	93,6431806.233,593876.873,107.772,va	152,6431844.180,593939.030,111.634,vu		
29,6431853.157,593950.110,106.162,na	94,6431810.213,593872.525,107.238,p	153,6431842.803,593948.388,112.866,vu		
30,6431852.519,593944.798,106.433,na	95,6431823.844,593881.104,107.407,p	154,6431842.636,593951.104,111.846,vu		
31,6431853.794,593939.497,106.609,na	96,6431817.500,593885.393,108.599,nu st	155,6431842.502,593954.591,113.329,vu		
32,6431855.849,593936.370,106.919,na	97,6431829.084,593889.464,108.761,nu	156,6431843.703,593954.871,113.348,vu		
33,6431857.596,593939.840,106.255,p	98,6431842.530,593887.599,108.838,nu	157,6431844.015,593961.048,113.030,vu		
34,6431865.056,593940.583,106.131,na	99,6431823.711,593867.910,107.133,p	158,6431842.076,593960.485,113.217,vu		
35,6431869.063,593941.654,106.286,na	100,6431824.690,593881.104,107.431,p	159,6431842.763,593965.227,111.184,nu st		
36,6431869.279,593944.708,105.711,p	101,6431816.700,593893.665,109.482,va			
37,6431865.101,593948.332,106.024,p	102,6431810.090,593908.398,109.672,va	160,6431841.711,593969.465,111.429,nu		
38,6431863.644,593955.724,105.960,p	103,6431803.950,593915.952,109.680,va	161,6431842.623,593971.596,111.541,nu		
39,6431865.066,593956.537,105.780,p	104,6431803.950,593915.971,109.680,nu st	162,6431845.081,593972.138,111.393,nu		
40,6431868.265,593951.188,105.467,p		163,6431846.877,593971.526,111.403,nu		
41,6431870.400,593946.774,105.488,p	105,6431806.255,593917.290,109.804,nu	164,6431851.822,593968.057,111.131,nu		
42,6431875.921,593947.895,106.876,a st	106,6431805.043,593917.276,109.572,na st	165,6431852.953,593968.851,111.215,nu		
43,6431879.490,593943.503,106.649,a		166,6431854.007,593969.802,110.614,nu		
44,6431882.737,593944.815,106.702,a	107,6431804.126,593926.505,109.990,nu	167,6431854.979,593971.297,110.293,nu		
45,6431882.207,593947.175,106.819,a	108,6431800.161,593926.485,108.795,na	168,6431847.675,593965.754,109.719,na st		
46,6431879.271,593950.918,106.996,a	109,6431798.207,593926.440,108.759,va			
47,6431876.420,593952.711,107.042,a cl	110,6431793.711,593936.932,108.524,va	169,6431844.922,593967.293,109.804,na		
48,6431876.469,593951.520,107.428,u st	111,6431795.583,593938.211,108.676,na	170,6431843.852,593969.302,110.020,na		
49,6431877.459,593949.546,107.358,u	112,6431800.253,593940.302,109.800,nu	171,6431845.359,593969.659,109.934,na		
50,6431878.182,593948.446,107.928,u	113,6431802.697,593950.069,110.122,nu	172,6431848.055,593967.385,109.693,na cl		
51,6431879.702,593947.219,107.651,u	114,6431792.798,593948.065,108.195,na			
52,6431880.354,593945.676,107.635,u	115,6431794.030,593950.638,108.376,na	173,6431853.717,593977.997,111.496,nu st		
53,6431887.686,593940.604,106.798,p	116,6431789.248,593951.881,108.140,va			
54,6431887.414,593934.395,106.481,a st	117,6431795.211,593957.318,108.561,va	174,6431854.731,593983.385,111.580,nu		
55,6431882.354,593934.904,105.998,a	118,6431795.372,593957.186,108.511,na	175,6431850.977,593990.018,111.582,va st		
56,6431881.165,593933.280,106.105,a	119,6431796.774,593959.197,109.066,nu			
57,6431882.108,593929.365,107.044,a	120,6431796.681,593959.276,109.013,va	176,6431851.623,593995.237,110.404,va		
58,6431884.195,593928.127,107.204,a	121,6431804.181,593959.548,110.167,p	177,6431853.012,593993.193,111.073,pole		
59,6431886.914,593928.689,106.576,a	122,6431782.368,593947.872,111.519,vu st	178,6431839.754,593994.795,109.730,va		
60,6431888.774,593931.194,106.233,a		179,6431839.846,593994.748,109.757,na st		
61,6431887.754,593933.834,106.507,a cl	123,6431812.850,593943.323,110.985,p			
62,6431885.171,593932.324,107.924,u st	124,6431812.924,593924.853,110.661,p	180,6431841.966,593992.604,110.427,va		
63,6431885.411,593931.487,107.982,u	125,6431818.672,593939.091,111.052,p	181,6431831.453,593999.245,108.797,p		
64,6431884.854,593931.054,107.944,u	126,6431837.664,593961.544,110.887,va st	182,6431831.325,594000.998,108.462,na st		
65,6431884.576,593931.853,107.938,u cl				
66,6431878.295,593927.575,108.721,lm	127,6431837.777,593953.791,111.136,va	183,6431793.489,594002.372,107.418,bpo st		
67,6431877.525,593927.037,109.277,nu st	128,6431840.348,593951.368,111.273,va			

184,6431793.444,594002.342,107.319,bpo st	59,6431969.930,594003.373,110.369,vu	131,6431953.719,593994.438,106.383,a2
185,6431793.470,594002.353,107.897,bpo st y	60,6431971.146,594001.062,109.210,a2 st	132,6431956.140,593995.586,106.284,a2
186,6431775.651,593960.109,106.627,va st	61,6431969.296,594000.919,109.231,a2	133,6431946.628,593990.540,106.320,va
187,6431773.138,593955.479,106.230,va	62,6431967.414,594002.506,109.044,a2	134,6431943.992,593990.703,106.312,va
188,6431774.589,593955.944,107.202,tokk	63,6431967.380,594004.822,108.871,a2	135,6431942.352,593992.010,106.178,va
189,6431776.187,593957.008,108.528,toru	64,6431967.681,594005.870,108.869,a2	136,6431941.426,593993.033,106.214,va
190,6431776.029,593956.980,108.887,toru s	65,6431968.544,594006.662,109.040,a2	137,6431940.972,593995.060,106.143,va
191,6431773.973,593949.494,106.248,va	66,6431969.977,594007.832,108.316,a2	138,6431940.813,593998.117,106.099,va
192,6431786.648,593925.278,108.184,va	67,6431967.482,594008.609,109.027,y2 st	139,6431943.391,593999.764,106.116,va
193,6431793.870,593900.530,107.096,va	68,6431967.298,594007.131,109.239,y2	140,6431946.802,594001.322,106.162,va
194,6431803.142,593885.001,110.121,pole	69,6431966.470,594006.063,108.965,y2	141,6431948.881,594002.346,106.219,va
1,6431917.572,593976.946,106.280,p	70,6431966.177,594004.969,109.096,y2	142,6431947.898,594004.470,106.216,va
2,6431941.678,593992.344,106.104,va st	71,6431966.050,594003.984,108.861,y2	143,6431947.886,594004.446,106.196,y st
3,6431947.121,593995.082,108.468,vu st	72,6431966.065,594002.301,108.935,y2	144,6431949.817,594003.968,106.599,y
4,6431946.697,593994.071,108.461,vu	73,6431965.881,594000.482,108.741,y2	145,6431951.574,594003.643,107.283,y
5,6431945.940,593994.489,108.407,vu	74,6431966.061,593998.098,108.007,y2	146,6431954.026,594004.760,107.564,y
6,6431945.247,593995.218,108.591,vu	75,6431965.584,593997.356,108.137,y2	147,6431955.007,594005.639,107.766,y
7,6431948.382,593997.535,108.692,vu	76,6431967.658,593996.474,107.833,y st	148,6431955.383,594006.617,107.728,y
8,6431952.463,594000.060,107.882,vu	77,6431966.142,593997.160,107.950,y	149,6431956.772,594007.169,107.925,y
9,6431954.270,594001.230,108.079,vu	78,6431965.316,593997.056,108.092,y	150,6431959.291,594007.674,108.779,y
10,6431955.668,594002.206,107.963,vu	79,6431964.089,593997.559,107.781,y	151,6431956.269,594005.977,107.566,a2 st
11,6431957.577,594003.224,108.542,vu	80,6431963.301,593997.325,107.779,y	152,6431955.397,594004.103,107.393,a2
12,6431960.576,594004.387,110.039,vu	81,6431963.820,593999.656,108.243,y	153,6431953.113,594002.833,107.129,a2
13,6431959.940,594006.942,109.011,vu	82,6431963.491,594002.243,108.930,y	154,6431951.065,594002.579,106.752,a2
14,6431959.716,594008.711,108.756,vu	83,6431962.515,594003.995,109.831,y	155,6431949.962,594006.200,106.269,va
15,6431960.457,594008.750,108.752,vu	84,6431961.336,594004.346,110.144,y	156,6431952.646,594008.809,106.319,va
16,6431962.789,594008.056,109.475,vu	85,6431962.936,594006.195,109.124,a2 st	157,6431956.401,594011.703,106.186,va
17,6431964.585,594008.439,109.537,vu	86,6431965.334,594006.446,108.884,a2	158,6431958.937,594002.490,106.064,va
18,6431967.435,594008.865,108.980,vu	87,6431966.884,594007.837,109.076,a2	159,6431960.549,594014.195,106.099,va
19,6431968.745,594009.034,108.955,vu	88,6431963.341,594005.891,109.022,a2 st	160,6431961.942,594014.430,106.215,va
20,6431970.749,594008.575,108.237,vu	89,6431964.779,594004.156,108.717,a2	161,6431961.263,594014.763,106.224,y st
21,6431970.990,594006.983,108.921,vu	90,6431964.522,594001.262,108.416,a2	162,6431959.611,594014.894,106.071,y
22,6431969.791,594004.788,110.205,vu	91,6431964.440,593999.054,108.075,a2	163,6431957.128,594008.274,106.138,y
23,6431970.028,594003.643,110.377,vu	92,6431965.328,594008.552,107.919,a2	164,6431954.203,594017.772,105.761,y
24,6431973.072,594003.875,108.826,vu	93,6431967.312,593997.985,107.853,a2	165,6431950.115,594014.382,105.918,y
25,6431975.525,594001.594,108.705,vu	94,6431966.593,593999.696,108.426,p	166,6431946.740,594011.440,106.110,y
26,6431977.320,593999.786,108.821,vu	95,6431966.755,594001.787,108.783,p	167,6431941.830,594001.640,106.019,y
27,6431979.159,593998.168,108.728,vu	96,6431966.672,594003.274,108.861,p	168,6431939.050,594006.660,106.019,y
28,6431979.971,593997.096,108.816,vu	97,6431969.515,593998.632,108.229,p	169,6431937.007,594006.906,105.983,y
29,6431980.603,593996.351,109.057,vu	98,6431971.356,593993.953,106.180,va st	170,6431933.827,594004.425,105.929,y
30,6431981.761,593994.858,109.006,vu	99,6431968.249,593992.360,106.140,va	171,6431929.545,594001.685,106.081,y
31,6431983.229,593994.129,108.551,vu	100,6431964.206,593991.940,106.003,va	172,6431926.782,593999.954,106.001,y
32,6431983.716,593992.763,108.537,vu	101,6431960.924,593991.432,105.483,va	173,6431927.380,593998.211,106.198,y
33,6431985.369,593992.188,108.313,vu	102,6431958.874,593992.477,105.310,va	174,6431922.860,593997.394,105.618,a st
34,6431984.147,593991.418,108.503,vu	103,6431958.018,593994.079,105.612,va	175,6431927.456,594002.453,105.102,a
35,6431982.690,593989.481,108.308,vu	104,6431956.774,593991.881,105.389,va	176,6431929.224,594003.505,104.973,a vp st
36,6431980.835,593988.495,108.250,vu	105,6431951.346,593989.335,105.376,va	177,6431934.597,594007.081,104.992,a vp
37,6431979.757,593989.265,108.530,vu	106,6431946.562,593987.316,105.620,va	178,6431937.562,594009.632,105.014,a vp
38,6431979.108,593990.406,108.352,vu	107,6431943.400,593985.952,105.810,va	179,6431939.181,594009.840,105.236,a
39,6431979.653,593991.575,108.205,vu	108,6431939.180,593985.181,106.376,va	180,6431939.244,594011.303,105.031,vp
40,6431980.030,593992.778,108.450,vu	109,6431938.891,593985.332,106.420,y st	181,6431941.157,594012.850,105.018,vp
41,6431980.664,593993.802,108.257,vu	110,6431943.863,593987.597,106.415,y	182,6431940.689,594014.835,105.019,vp
42,6431979.933,593991.318,108.178,p	111,6431948.185,593990.298,106.451,y	183,6431940.791,594010.366,105.205,a
43,6431980.939,593990.558,108.462,p	112,6431949.281,593990.973,106.451,y	184,6431942.522,594013.215,105.155,a
44,6431981.927,593989.728,108.139,p	113,6431950.936,593991.991,106.871,y	185,6431945.456,594013.745,105.259,a
45,6431982.872,593990.959,108.212,p	114,6431952.664,593992.772,106.919,y	186,6431948.335,594015.173,105.151,a
46,6431982.181,593991.811,108.568,p	115,6431954.053,593993.052,106.767,y	187,6431947.251,594017.041,104.836,vp st
47,6431981.188,593992.842,108.219,p	116,6431955.438,593993.996,106.640,y	188,6431948.955,594016.600,104.802,a vp
48,6431981.263,593994.926,108.938,vu	117,6431957.146,593995.776,106.184,y	189,6431951.706,594018.897,104.817,a vp
49,6431980.091,593996.486,108.973,vu	118,6431958.335,593995.625,106.104,y	190,6431954.034,594019.786,104.809,a vp
50,6431977.714,593997.214,108.425,vu a2st	119,6431959.216,593994.766,106.135,y	191,6431956.548,594019.198,104.801,a vp
51,6431975.988,593999.119,108.606,a2	120,6431961.312,593993.954,106.126,y	192,6431957.984,594019.061,104.819,a vp
52,6431974.434,594000.787,108.619,a2	121,6431961.354,593994.477,106.234,va st	193,6431960.378,594018.085,104.826,a vp
53,6431973.182,594001.464,108.801,a2	122,6431960.572,593995.984,106.229,va	194,6431963.141,594017.084,104.777,a vp
54,6431972.703,594002.325,108.894,a2	123,6431959.924,593997.254,106.091,va	195,6431965.247,594016.588,104.631,a vp
55,6431975.536,593997.648,109.092,vu	124,6431957.067,593998.288,106.201,va	196,6431967.687,594015.675,104.863,a vp
56,6431973.424,593999.211,109.433,vu	125,6431954.523,593998.044,106.292,va	197,6431969.773,594015.310,104.827,a vp
57,6431971.887,594000.477,109.514,vu	126,6431952.457,593995.739,106.373,va	198,6431969.262,594017.035,104.774,vp
58,6431970.878,594000.857,109.218,vu	127,6431950.654,593993.293,106.512,va	199,6431968.167,594016.882,104.678,p
	128,6431949.588,593992.273,106.882,va	200,6431971.011,594015.327,104.929,a
	129,6431950.666,593993.100,106.521,a2 st	201,6431974.087,594013.916,105.183,a
	130,6431951.977,593993.825,106.667,a2	

202,6431977.120,594009.422,105.460,a	273,6431939.588,593980.586,106.607,y	344,6431965.960,593903.962,106.049,p
203,6431979.888,594006.834,105.461,a	274,6431939.225,593977.298,106.719,y	345,6431964.387,593906.955,105.900,p
204,6431983.237,594003.459,105.713,a	275,6431940.702,593974.877,106.842,y	346,6431963.129,593915.011,105.831,p
205,6431985.134,594001.031,106.131,a	276,6431942.086,593973.535,106.714,y va	347,6431960.136,593925.033,105.671,p
206,6431986.848,594000.026,106.405,a	st	348,6431954.374,593929.829,105.513,p
207,6431988.482,593996.838,106.485,a	277,6431941.388,593972.657,106.880,va	349,6431952.273,593934.609,105.427,p
208,6431989.064,593993.364,106.368,a	278,6431940.271,593974.102,106.886,va	350,6431947.707,593938.208,105.303,p
209,6431988.614,593996.227,106.531,y st	279,6431938.570,593972.088,106.672,va	351,6431946.960,593940.300,105.348,p
210,6431985.941,593998.711,107.080,y	280,6431937.959,593970.862,106.754,va	352,6431941.199,593935.968,105.338,p
211,6431984.510,593999.121,106.905,y	281,6431939.567,593971.280,107.388,vu	353,6431938.889,593939.156,105.358,p
212,6431982.560,594000.520,107.022,y	st	354,6431927.265,593941.284,106.061,p
213,6431981.797,594002.275,106.733,y	282,6431940.618,593971.764,107.526,vu	355,6431938.457,593964.739,105.128,vt
214,6431979.854,594004.416,106.292,y	283,6431942.092,593971.309,107.307,vu	356,6431938.755,593964.080,104.657,p
215,6431978.667,594005.747,106.143,y	284,6431947.173,593970.730,110.205,vu	1,6431917.458,593989.106,106.589,p
216,6431977.014,594007.130,106.306,y	285,6431948.264,593971.980,110.052,vu	2,6431930.065,594001.917,106.042,p
217,6431975.452,594008.796,106.300,y	286,6431949.691,593972.058,109.625,vu	3,6431929.849,594003.917,104.995,vt
218,6431974.258,594010.605,106.099,y	287,6431950.845,593971.580,110.077,vu	4,6431930.365,594005.543,104.797,p
219,6431973.297,594011.704,106.253,y	288,6431952.073,593969.909,111.308,vu	5,6431944.731,594012.517,105.356,p
220,6431971.928,594013.103,106.148,y	289,6431953.603,593968.895,111.560,vu	6,6431943.013,594019.014,105.032,p
221,6431971.720,594012.832,106.126,a2	290,6431955.375,593967.719,111.257,vu	7,6431945.531,594018.289,104.803,vt
st	291,6431954.610,593965.478,111.515,vu	8,6431950.678,594022.351,104.446,p
222,6431973.421,594011.097,106.192,a2	292,6431954.570,593963.257,111.033,vu	9,6431954.487,594022.618,104.044,p
223,6431975.198,594008.899,106.289,a2	293,6431955.469,593962.015,110.524,vu	10,6431958.716,594020.231,104.038,p
224,6431977.657,594006.108,106.229,a2	294,6431970.313,593962.647,106.143,p	11,6431947.462,594031.500,106.453,p
225,6431979.111,594004.506,106.202,a2	295,6431981.158,593958.981,106.201,p	12,6431953.678,594045.180,109.310,p
226,6431980.423,594002.669,106.463,a2	296,6431976.913,593949.824,105.932,a st	13,6431957.095,594058.763,109.189,pp
227,6431982.419,594000.082,107.060,a2	297,6431973.533,593948.606,106.052,a	met
228,6431983.173,593998.735,106.877,a2	298,6431972.583,593947.955,106.095,a	14,6431957.087,594058.762,109.595,pp
229,6431984.424,593998.264,106.880,a2	299,6431972.494,593944.436,105.775,a	met
230,6431986.006,593997.661,106.811,a2	300,6431973.659,593941.049,105.910,a	15,6431965.698,594052.366,108.844,pp
231,6431988.092,593996.046,106.468,a2	301,6431976.772,593939.105,105.997,a	met
232,6431988.864,593993.802,106.366,a2 a	302,6431980.709,593939.623,106.290,a	16,6431965.676,594052.368,109.313,pp
233,6431989.364,593991.369,106.423,a	303,6431984.948,593940.124,106.417,a	met
234,6431989.800,593985.186,106.557,a	304,6431989.548,593938.569,106.612,a	17,6431965.635,594052.389,108.856,pp
235,6431987.592,593988.935,106.502,a	305,6431991.139,593936.613,106.969,a	met
236,6431986.763,593987.263,106.626,a	306,6431990.573,593932.252,107.237,a	18,6431964.846,594050.723,108.980,p
237,6431983.337,593985.915,106.457,a	307,6431990.221,593929.598,107.453,a	19,6431961.166,594047.369,109.287,p
238,6431979.800,593985.186,106.483,a	308,6431989.548,593929.705,107.656,y st	20,6431961.424,594041.982,109.271,p
239,6431977.931,593985.221,106.346,a	309,6431989.392,593934.062,107.593,y	21,6432003.583,594010.618,109.947,p
240,6431975.323,593987.464,106.297,a	310,6431989.384,593936.638,107.504,y	22,6432029.962,594003.921,109.468,pp
241,6431974.561,593989.579,106.207,a	311,6431987.847,593936.214,107.083,y	bet
242,6431974.934,593991.369,106.227,a	312,6431984.335,593935.455,107.268,y	23,6432030.000,594003.977,109.827,pp
243,6431973.933,593993.121,106.155,a	313,6431981.462,593936.214,107.130,y	bet
244,6431976.892,593993.932,107.132,a2	314,6431979.140,593935.124,106.992,y	24,6432030.853,593997.319,109.562,kivi
st	315,6431977.679,593932.185,107.158,y	0.7
245,6431978.322,593993.962,107.495,a2	316,6431976.515,593931.758,107.633,y	25,6432018.033,593979.975,109.940,p
246,6431980.661,593993.626,108.241,a2	317,6431975.676,593931.421,107.940,y	26,6432012.570,593976.622,109.787,p
247,6431976.126,593982.320,106.074,p	318,6431974.359,593932.147,107.692,y	27,6432010.287,593975.935,110.507,p
248,6431985.498,593981.312,106.482,p	319,6431972.593,593934.470,107.443,y	28,6432008.224,593974.629,109.927,p
249,6431990.365,593982.877,106.761,p	320,6431971.526,593936.238,107.677,y	29,6432012.963,593968.277,109.895,p
250,6431996.445,593985.867,106.554,p	321,6431970.040,593929.209,107.728,y	30,6432014.281,593966.820,110.889,p
251,6431996.473,593974.993,106.490,p	322,6431968.410,593941.165,107.715,y	31,6432018.514,593966.014,111.140,p
252,6431989.427,593973.627,106.637,p	323,6431968.611,593942.315,107.826,y	32,6432020.153,593962.303,110.948,v st
253,6431983.007,593972.747,106.493,p	324,6431967.028,593944.545,108.171,y	33,6432017.458,593958.661,111.113,v
254,6431976.549,593972.477,106.003,p	325,6431968.001,593946.314,108.178,y	34,6432012.898,593958.327,111.150,v
255,6431975.265,593972.196,106.210,p	326,6431968.843,593948.706,108.193,y	35,6432007.978,593961.442,108.144,y st v
256,6431968.469,593970.421,106.151,p	327,6431969.987,593951.371,108.504,y	st
257,6431962.486,593969.714,106.033,va	328,6431971.474,593951.403,107.996,y	36,6432005.169,593962.990,107.839,y
st	329,6431971.212,593938.824,107.301,y2	37,6432008.980,593965.832,107.901,v
258,6431959.271,593973.781,106.114,va	st a2 st	38,6432009.850,593968.136,108.346,v
259,6431959.425,593975.792,106.006,va	330,6431975.292,593936.752,106.807,y2	39,6432009.241,593969.880,107.555,v
260,6431956.522,593978.351,105.906,va	331,6431978.357,593936.436,106.734,y2	40,6432005.910,593967.981,108.328,y
261,6431953.954,593979.828,105.675,va	332,6431974.578,593934.843,106.866,a2	41,6432005.077,593969.789,107.542,y
262,6431951.267,593978.827,105.549,va	333,6431975.790,593933.230,106.790,a2	42,6432004.719,593972.392,107.748,y v
263,6431946.363,593978.043,105.516,va	334,6431977.682,593935.807,106.743,a2	43,6431994.954,593968.985,106.188,p
264,6431944.184,593976.822,105.627,va	335,6431980.760,593931.218,107.045,p	44,6431994.543,593941.987,106.635,p
265,6431943.080,593976.056,105.714,va	336,6431981.438,593926.159,107.383,p	45,6431992.398,593927.252,107.460,p
266,6431942.620,593978.176,105.468,va	337,6431984.607,593928.509,107.205,p	46,6431984.225,593922.394,108.739,y st
267,6431943.715,593980.136,105.394,va	338,6431989.885,593926.671,107.562,p	47,6431983.154,593913.734,108.940,y
268,6431944.523,593981.827,105.597,va	339,6431994.098,593918.751,107.255,p	48,6431982.295,593910.385,108.084,y
269,6431950.517,593983.669,105.476,p	340,6431987.375,593913.434,107.101,p	49,6431983.722,593889.318,106.353,a st
270,6431942.771,593981.486,105.974,y st	341,6431986.806,593902.362,107.090,p	kat krs
271,6431941.551,593981.337,106.250,y	342,6431979.357,593902.905,106.898,p	50,6431981.736,593885.373,107.534,a
272,6431940.379,593980.774,106.593,y	343,6431968.392,593893.460,106.070,a st	51,6431981.974,593883.043,107.664,a

52,6431981.262,593878.934,106.417,a
53,6431982.567,593876.550,106.220,a
54,6431987.727,593880.199,106.307,a
55,6431987.067,593888.182,106.456,a cl
56,6431983.988,593885.062,108.409,y st
57,6431984.514,593881.709,108.485,y
58,6431985.451,593874.067,105.243,ma
roog
59,6432005.801,593859.802,110.237,pp
puudub vaja kontr kat ja me nihkes
60,6431963.849,593862.116,109.294,p
61,6431954.669,593865.779,107.401,y st
62,6431952.950,593868.093,107.263,y
63,6431946.947,593860.865,107.342,y
64,6431949.170,593859.278,107.405,y cl
65,6431940.601,593856.146,105.352,ma vt
66,6431956.991,593834.562,112.799,pp
bet
67,6431957.068,593834.497,113.372,pp
bet
68,6431950.060,593837.393,110.644,p
69,6431930.918,593812.451,105.898,p
70,6431934.043,593782.835,106.894,p
71,6431936.782,593765.060,106.949,p
72,6431933.607,593753.950,106.861,kuiv
73,6431955.458,593733.151,112.074,pp
bet
74,6431955.436,593733.229,112.457,pp
bet
75,6431931.885,593704.629,108.924,p
76,6431927.668,593706.600,108.577,p
77,6431939.328,593692.770,108.314,pp
bet
78,6431939.259,593692.909,108.686,pp
bet
79,6431927.597,593689.536,107.748,p
80,6431926.060,593690.579,108.348,p
81,6431925.412,593692.975,108.623,vsa
82,6431907.315,593702.197,109.525,p
83,6431871.725,593713.816,109.251,lm
84,6431861.735,593697.526,108.103,puud
ub_lm
85,6431850.263,593717.988,108.803,pp
met
86,6431850.321,593717.977,109.288,pp
met
87,6431839.130,593720.862,108.532,pp
met
88,6431822.710,593733.811,108.235,p
89,6431794.224,593791.067,107.667,pp
bet h? h0.31m
90,6431766.059,593863.616,106.946,pp
met
91,6431766.044,593863.603,107.663,pp
met
92,6431804.468,593886.191,110.481,pp
bet viltu
93,6431841.711,593876.879,108.165,p
94,6431854.013,593867.378,107.359,p
95,6431879.930,593829.412,106.466,lm
96,6431882.470,593828.762,105.396,vt
97,6431912.642,593815.162,107.324,pupo
98,6431895.068,593791.545,106.735,pupo
13
99,6431833.145,593834.326,107.112,lm
100,6431830.542,593845.807,106.701,lm
101,6431859.109,593863.215,107.256,p